A REVOLUTIONARY CONSTRUCTION

DEFEATING THE DESTRUCTIVE FACTORS:

Impact

Abrasion

Corrosion

FOR USE IN CONSTRUCTING:

- CURBS
- DRIVEWAYS
- EDGES OF PAVEMENT
- TRAFFIC MARKERS
- DOORWAYS
- COLUMN GUARDS
- WHEEL GUARDS
- LOADING PLATFORMS
- RAILWAY PLATFORMS
- SURBASES
- WAINSCOTING
- TRENCH FRAMES
  - With Covers
  - With Gratings

ARMORED CONCRETE

A Revolutionary Construction

THE architect and the engineer have long sought an enduring construction for parts of structures subject to heavy impact and severe abrasion. Neither concrete alone, nor concrete in any metallic combination heretofore available, successfully resists these two destructive forces. Nor does any kind of stone solve this problem under modern traffic conditions.

Ten years ago, Robert E. Moore, an experienced engineer, conceived the idea of a revolutionary construction principle that would combine the resistance characteristics of two well-known construction materials — concrete and cast iron. The result was ARMORED CONCRETE, pictured and described on the following pages. It was a concept so basic that United States patents were granted.

What Is Armored Concrete?

ARMORED CONCRETE is concrete armored with gray cast iron. The armor of cast iron is bonded to the concrete in such a way that no part of it can vibrate in the slightest degree. Consequently there can be no fracture of the cast iron. And since cast iron is *incompressible* no impact is transmitted into the concrete.

Because it can be cast into the most complex curves, form work is entirely eliminated; and because cast iron has the same coefficient of expansion as the concrete itself, ARMORED CONCRETE is the ideal type of construction for surfaces subject to impact, abrasion, corrosion and variations of temperature or moisture.

Inasmuch as the only positive test of a new type of construction is the double test of *time* and *performance,* applications of ARMORED CONCRETE were confined almost exclusively to the New York area for a period of ten years. Points were selected, such as the Holland Tunnel, where this revolutionary construction would be subjected to the most severe conditions of impact and abrasion. These points were closely watched over a period of years. ARMORED CONCRETE withstood every test *without a single failure.* Today, after extensive trial, it is ready for general use.

Now — A National Service

NOW, for the first time, this construction is available to architects and construction interests from coast to coast. Through a license relationship between the Armored Concrete Corporation, of Newark, New Jersey, and The American Brake Shoe & Foundry Company, with fifteen strategically located plants, architects and engineers in any section of the country may now specify ARMORED CONCRETE.

Ten years of practical experience with the product and its possibilities is at the disposal of the architect or engineer desiring to take advantage of this construction. Equally important in using cast iron in construction work, he will be dealing with a nationally known company with half a century of experience. He will be assured of dependable castings, and will have the benefit of complete engineering service. Furthermore, he will be able to figure costs with assurance.

Consultation is invited. Estimates will be prepared without obligation.

HEAVY TRAFFIC CORNERS, NEWARK, N. J.

The Bamberger corner with an older style of metal veneer. Unable to save the concrete from the heavy impact.

Bamberger corner, Market and Halsey Streets, Newark, N. J. One of America's heavy traffic corners.

The same corner protected with ARMORED CONCRETE, in perfect condition after six years of service. An unusually severe test because of very sharp corner, with thin shelf of concrete.

These unretouched photographs tell the story of ARMORED CONCRETE'S solution to peculiarly difficult corner problems.

The Prudential corner with heavy stone curbing, badly damaged from heavy impact and abrasion.

Prudential Building corner, Washington and Bank Streets. Another heavy traffic corner in busy Newark.

The same corner protected with ARMORED CONCRETE, after three years of service. Note perfect condition of both the cast iron armor and the concrete.

Geo. W. Andress, Engineer in Charge of Highways, Newark, N. J.

ARMORED CONCRETE

An Impact and Abrasion Resistant Construction

ARMORED CONCRETE has been well described as "the closest approach to eternal construction." It is a unitary composite structure of gray cast iron and concrete. The concrete is armored on the vertical exposed surface by the gray iron component.

Separately, either concrete or cast iron fail under impact. Together as a composite structure, ARMORED CONCRETE is so designed that impacts are absorbed without injury to either the cast iron armor or the concrete.

Characteristics

1 IMPACT RESISTANCE

ARMORED CONCRETE is the only known structure that resists impacts perfectly.

2 ABRASION RESISTANCE

All surfaces subject to abrasion are protected by the cast iron component. The performance of cast iron under abrasion is well known to architects and engineers.

3 CORROSION RESISTANCE

Of all the ferrous metals cast iron, even unpainted, corrodes the least. With ARMORED CONCRETE corrosion is no problem.

4 VARIATION OF TEMPERATURE AND MOISTURE CONTENT

The coefficients of expansion of cast iron and concrete are identical. Because of this fortunate fact, ARMORED CONCRETE is not affected in the least by temperature or moisture variations.

5 FIRE RESISTANCE

The cast iron component of ARMORED CONCRETE is not affected by fire.

6 ELIMINATION OF FORMS

Due to the low center of gravity and weight, exterior forms are eliminated. This greatly simplifies construction and reduces costs.

7 MAINTENANCE

With ARMORED CONCRETE maintenance costs are nil.

8 APPEARANCE

ARMORED CONCRETE is exceptionally pleasing in appearance, the cast iron component being hardly detectable.

[ARMORED CONCRETE *has withstood the most severe tests of actual service during the past ten years. A list of notable installations will be found on back page.*]

HOLLAND TUNNEL APPLICATIONS OF ARMORED CONCRETE

WHEN the Holland Tunnel was opened for traffic, stone was installed for curbs throughout the tubes, as being the best material available. At certain points of severe impact and abrasion, notably at entrance and exit curbs of truck sides of tunnel, abrasion of 2½ inches was measured in five years.

At these points ARMORED CONCRETE was installed in December, 1933. After 14 months of service, during which nearly three million trucks passed these points, Tunnel Engineers reported that there was *no measurable abrasion.* Nor were there any fractures.

Working drawing on opposite page shows Lane Guides, Islands, etc., installed March, 1935, at entrances to Holland Tunnel, New Jersey side.

Original curb replaced with ARMORED CONCRETE between arrows.

Effective application of ARMORED CONCRETE. Traffic marker across pavement at Tunnel exit, New York side.

Toll Booth, approaching Tunnel, New Jersey side. Note narrow curbing of ARMORED CONCRETE. A severe test of this revolutionary construction.

Curb at Tunnel entrance, New Jersey side. Arrow points to juncture of ARMORED CONCRETE (left) and stone curbing.

ARMORED CONCRETE CURBS

THE PORT OF NEW YORK AUTHORITY
THE HOLLAND TUNNEL
DIVIDING ISLANDS AND LANE GUIDE FOR NEW JERSEY TOLL BOOTHS

SCHEDULE & NOTATIONS

PCS REQ	FIELD MARK	LENGT	CODE NUMBERS	NOTES
38	S	5'-0"	42202	FOR ISLANDS A-B-C
6	X	4'-4"	42203	DITTO
6	R		42204	RADIAL COMPONENT
1	L		42205	FOR LANE GUIDE D
1	M		42206	DITTO
1	N		42207	DITTO

A. CAST IRON COMPONENT OF CLOSE GRAINED GRAY IRON

B. THE COMPOSITE CAST IRON & CONCRETE STRUCTURE ARE BOTH PROTECTED BY US. LETTERS PATENT Nº 1,789,829

PLAN OF ISLANDS A & B - SCALE 1/4"=1'-0"

PLAN OF ISLAND C SCALE 1/4"=1'-0"

5/8" ϕ REINFORCING BARS BY OTHERS
24 PCS @ 18" FOR ISLAND "A"
24 " @ 18" " " "B"
37 " @ 18" " " "C"
1 " @ 24" " GUIDE "D"

TOP OF ISLANDS A B C

BATTER

ROADWAY LEVEL

4'-10"

TYPICAL SECTION Y-Y THROUGH ISLANDS A-B-C
SHOWING COMPOSITE CONSTRUCTION
SCALE 1 1/2"=1'-0"

BOOTH ISLAND

4'-0" RADIUS

LANE GUIDE -D- SCALE 1 1/2"=1'-0"

LANE GUIDE TO FIT CONTOUR

45°

5" RADIUS

12'-0"

ROSE END OF SECTION
SCALE 1 1/2"=1'-0"

3" RADIUS

1" RADIUS

3/8" ϕ BARS

2'-4" FOOTING

SECTION X-X THROUGH LANE GUIDE -D- SCALE 1 1/2"=1'-0"

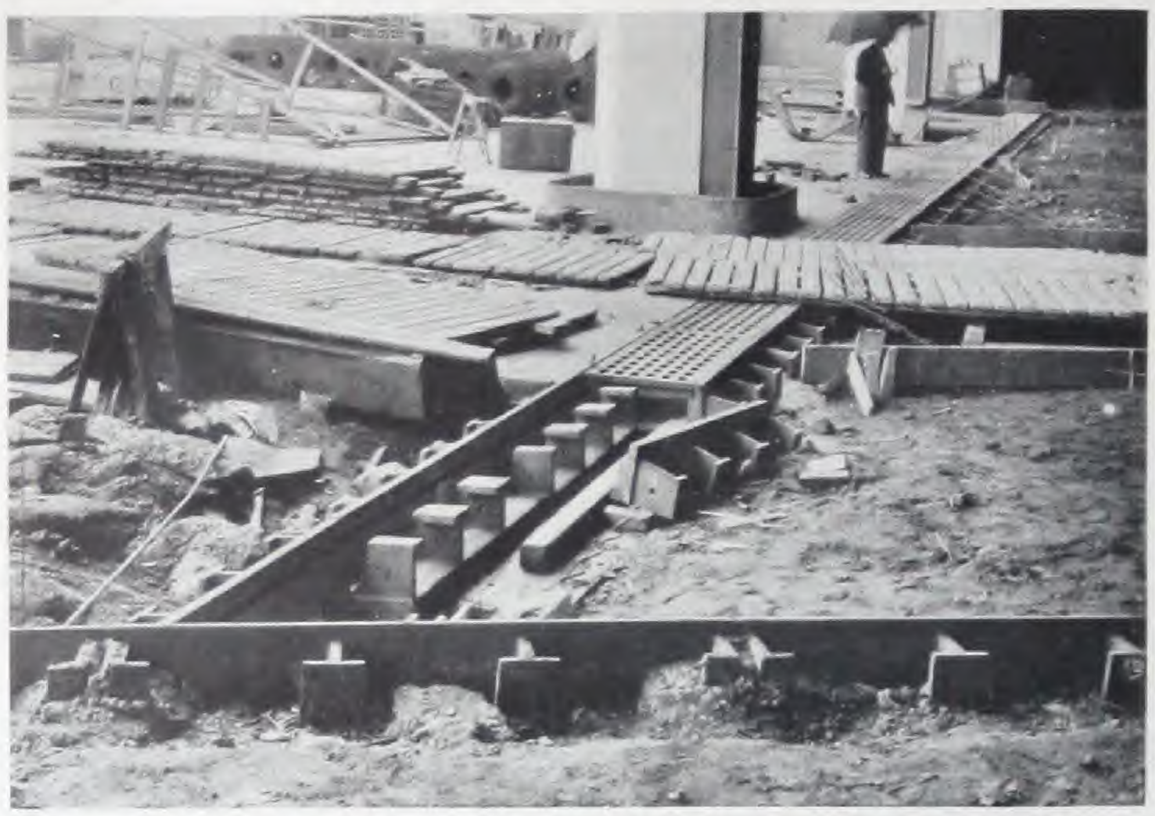
ARMORED CONCRETE CONSTRUCTION | DEPARTMENT OF RESEARCH & DEVELOPMENT

DRAWN BY Louis Arcnowitz | SCALE SEE ABOVE
APPROVED BY Robert E. Moore | DEC 28 1934

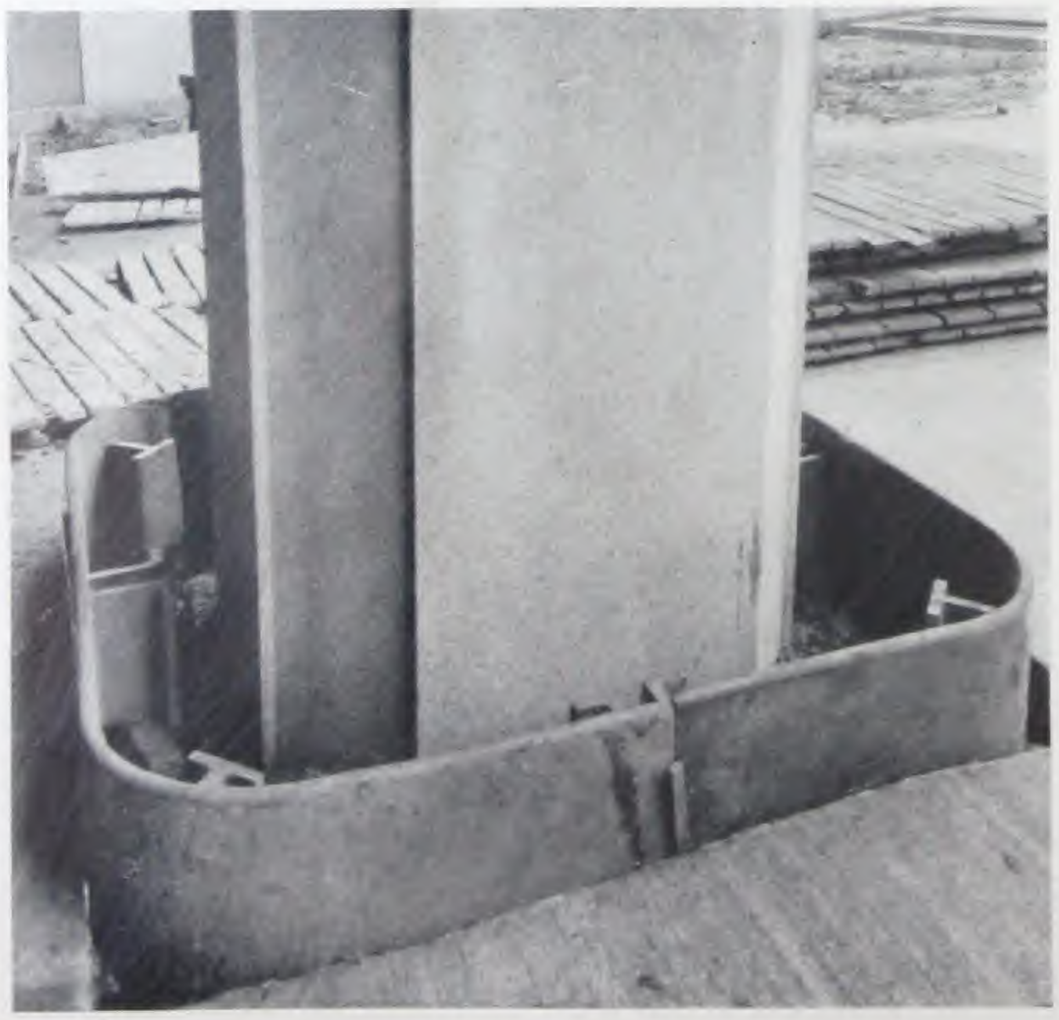
[5]

ARMORED CONCRETE IN THE PENNSYLVANIA STATION AT NEWARK, N. J.

Pennsylvania Railroad Station, Newark, N. J., in course of construction. McKim, Mead & White, Architects.



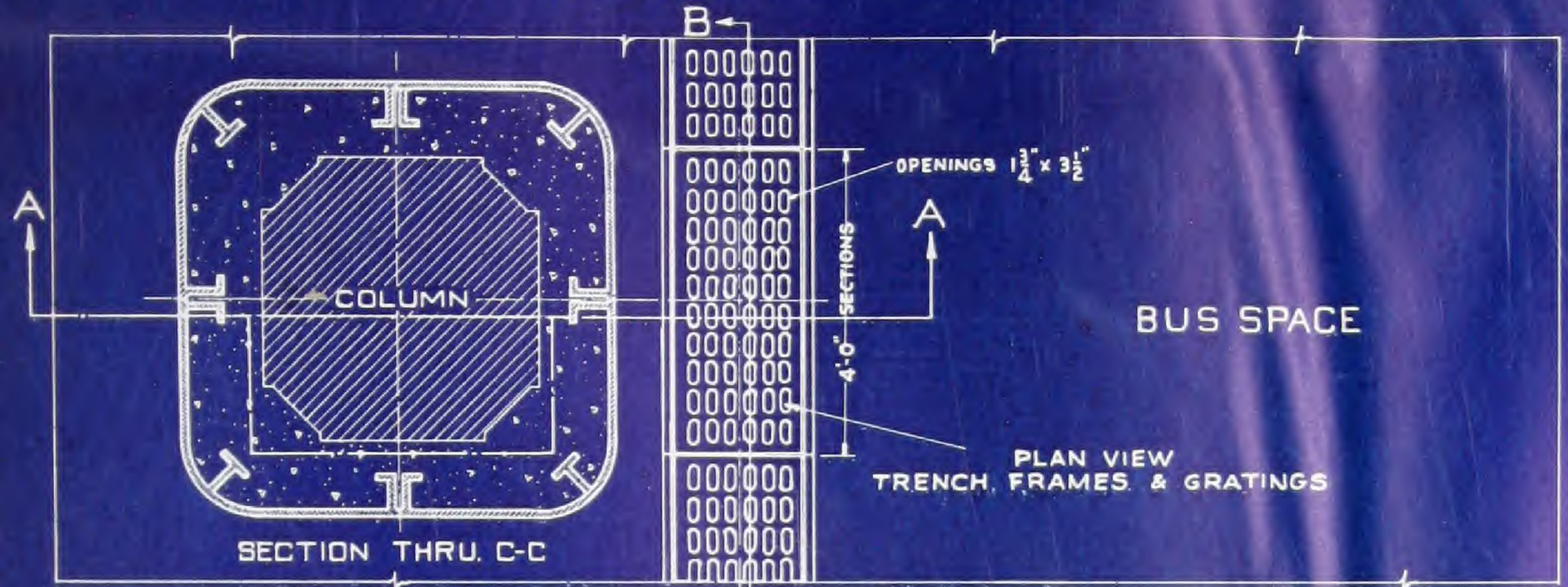
Showing ARMORED CONCRETE Trench Frames and Gratings, Curb, and Column Guards before pouring concrete. Detailed drawings on opposite page.

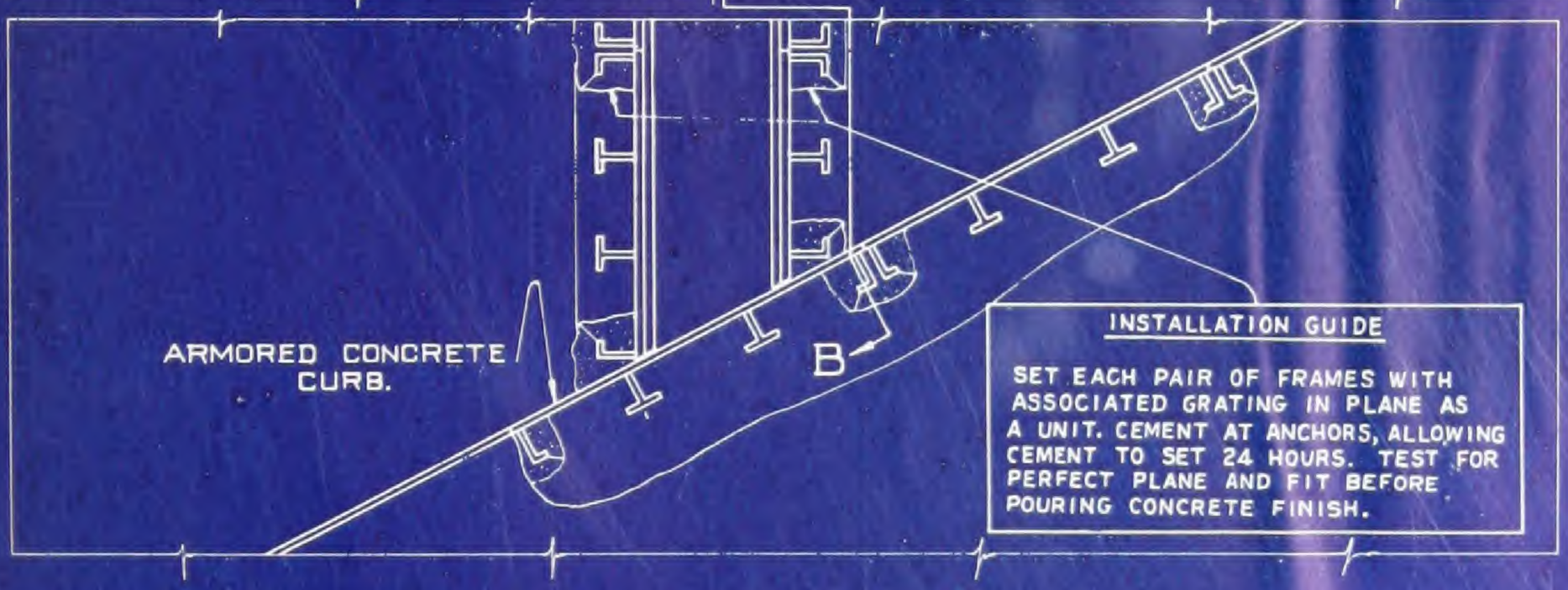


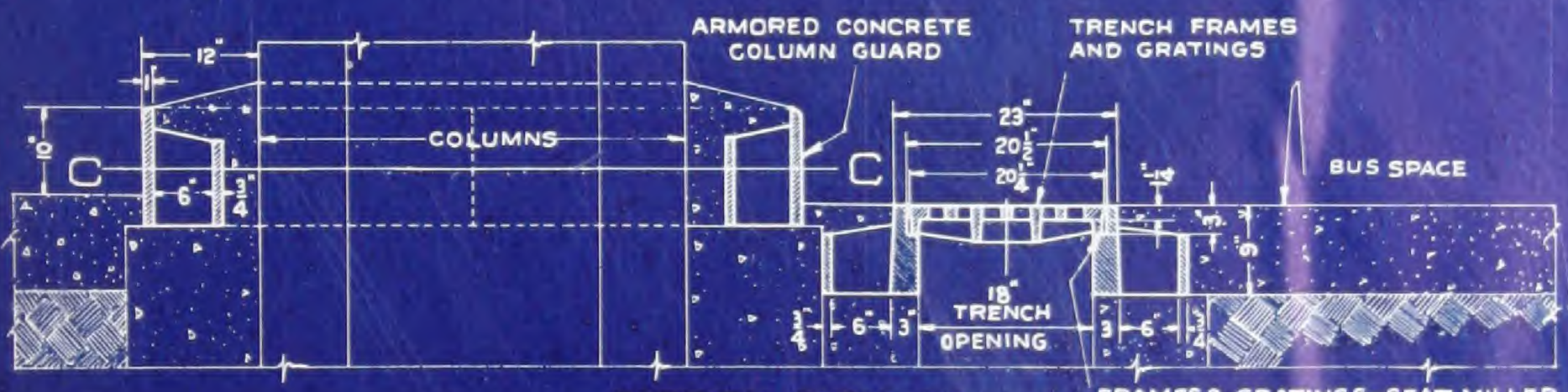
Column Guard set, ready for the concrete to be poured. Note the anchorage at the bends and joints.

Cast iron component at Bus Loading Platform, set in place and ready for concrete to be poured.

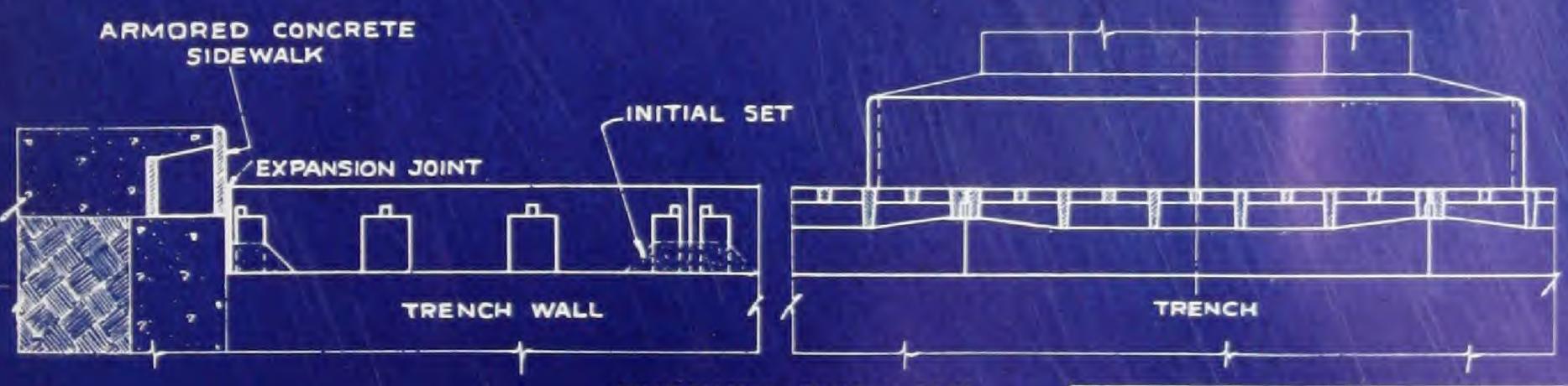
ARMORED CONCRETE CONSTRUCTION
SOUTH PLAZA - P.R.R. CO. STATION NEWARK N. J.
MC. KIM, MEAD & WHITE – ARCHITECTS







SECTION THRU. A-A



SECTION THRU. B-B

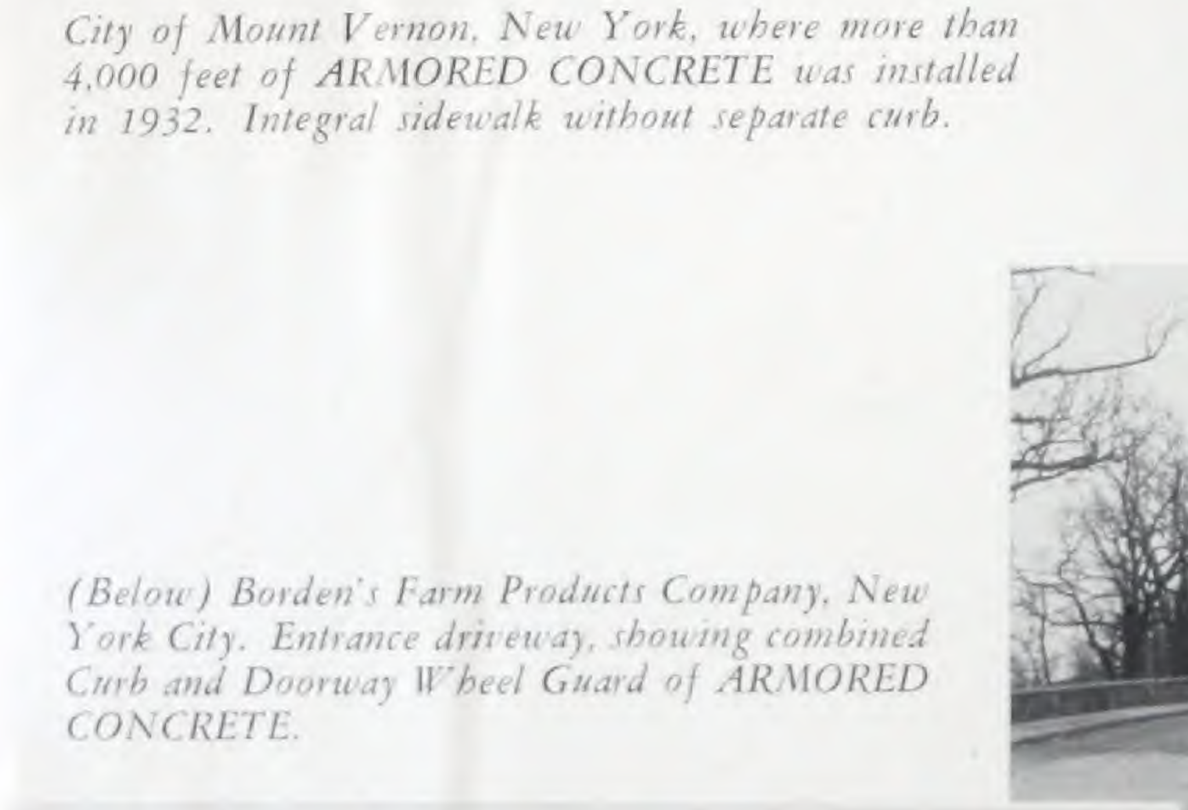
THE COMPOSITE CAST IRON AND CONCRETE STRUCTURE ARE BOTH PROTECTED BY U.S. LETTERS PATENT NO. 1789829

Representative
ARMORED

City of Mount Vernon, New York, where more than 4,000 feet of ARMORED CONCRETE was installed in 1932. Integral sidewalk without separate curb.

Detail of Integral Sidewalk and Curb, at Catch Basin, Mount Vernon, New York.

(Below) Borden's Farm Products Company, New York City. Entrance driveway, showing combined Curb and Doorway Wheel Guard of ARMORED CONCRETE.



West Point, New York. ARMORED CONCRETE at sharp curve in U. S. Military Academy Reservation. Photographed after three years of hard service.

Installations of CONCRETE

ARMORED CONCRETE Ramp and Curbing, in Port of New York Authority Building. Note complex curve.

Port of New York Authority, Inland Terminal No. 1. In this building, the largest edifice on Manhattan Island, will be found 4,000 feet of ARMORED CONCRETE.

Bank Street side, L. Bamberger Building, Newark, N. J., showing ARMORED CONCRETE Curbing, after six years of service. Note perfect plane of sidewalk. Imagine the abrasion this curbing suffers.

(Below) ARMORED CONCRETE Loading Platform, New York Central Yards, New York City.

ARMORED CONCRETE INSTALLATIONS

OWNER	PROJECT	LOCATION	ARCHITECT OR ENGINEER
Port of New York Authority	Holland Tunnel	New York City	Owners
Port of New York Authority	Inland Terminal	New York City	Owners
U. S. Government	U. S. Military Academy	West Point, N. Y.	Owners
Pennsylvania R. R.	Station	Newark, N. J.	McKim, Mead & White
N. Y. Central R. R. Co.	St. John's Park Terminal	New York City	Owners
N. Y. Central R. R. Co.	Platforms at Grand Central Terminal	New York City	Owners
N. Y. Central R. R. Co.	Railroad Loading Platform	New York City	Owners
New York Dock Dept.	Piers 88-90-92, North River	New York City	Owners
Pennsylvania R. R.	Pier F	Jersey City, N. J.	Owners
Western Electric Co.	Industrial Plant	Kearny, N. J.	Owners
General Electric Co.	Industrial Plant	Newark, N. J.	Owners
Sheffield Farms Co.	Milk Depots	Metropolitan New York	Stohldrier & Zetsche and others
Borden's Farm Products Co., Inc.	Milk Depots	Metropolitan New York	Owners
Prudential Insurance Co.	Office Building	Newark, N. J.	Owners
L. Bamberger & Co.	Dept. Store	Newark, N. J.	Jarvis Hunt
City of Newark, N. J.	Art School	Newark, N. J.	Guilbert & Betelle
City of Newark, N. J.	Barringer High School	Newark, N. J.	Guilbert & Betelle
State of New Jersey	Teachers College	Ewing, N. J.	Guilbert & Betelle
Wilmington, Del.	Mary Williams School	Wilmington, Del.	Guilbert & Betelle
Addressograph Multigraph Co.	Industrial Plant	Cleveland, Ohio	Ernest McGeorge Inc.
Hoffman Beverage Co.	Brewery	Newark, N. J.	Eppel & Kahrs
Daniel Reeves	Warehouse	New York City	Scacchetti & Siegel
Mt. Vernon, N. Y.	4000' Curbing	Mt. Vernon, N. Y.	Owners
Knickerbocker Ice	Station	New York City	Owners
Newark, N. J.	Curbing	Various Streets	Geo. W. Andress